Reliable Machine and Mfg Co Inc

Iowa Center for Industrial Research and Service

Reliable Machine and Mfg. Co. Assures Customers Tooling is 'Reliable'

Client Profile:
Reliable Machine and Mfg. Co. (Reliable) is a family-owned Cedar Rapids, Iowa-based machining and tooling company. Reliable was established as a machine shop in 1940 and currently employs 30 people. The company specializes in manufacturing and repairing machined parts for various industries, namely agriculture, food processing, chemical processing, and paper processing. Reliable also has a second business venture whereby they provide cutting tools to other machining companies across Iowa and the Midwest.

Situation:
During the summer of 2008, Cedar Rapids, Iowa was hit with one of the most devastating floods in U.S. history. Downtown Cedar Rapids, including Reliable, was buried under flood waters from the Cedar River which runs through the middle of the city. Reliable prepared for the advancing waters by moving items off the floor, disconnecting electrical service and moving inventory to higher ground. However, the flood waters rose 8 feet above the forecasted levels, filling up buildings, homes and businesses. All of the company's machinery, equipment, inventory and tooling was submerged as the water rose to the ceiling. Once the water subsided, Reliable was left with the task of cleaning up water, mud, sludge and residue from the entire facility, refurbishing all of its equipment, rebuilding its facilities and replacing lost or damaged inventory. As days and weeks passed and their equipment came back on line, Reliable slowly began to manufacture gears and shafts. In addition, Reliable began selling tooling to machining companies; however their customers became concerned about the carbide cutting tools submerged in the flood waters. As it turned out, the water and sludge filled the packages of tooling and tarnished the coatings on some of the tooling, making them look dull or discolored. Reliable cleaned the tooling and packaging as best they could, however, the tools were not aesthetically the same as 'non-flooded' tooling. Reliable offered discounts to its customers but the customers wanted assurance the tooling would perform as well (and as long) as the non-flooded tooling. Without this assurance, 40 percent of Reliable's tooling inventory was questionable and in jeopardy of becoming worthless, causing yet another financial blow to the family business. Reliable contacted Iowa State University's (ISU) Center for Industrial Research and Service (CIRAS), a NIST MEP network affiliate, for help.

Solution:
CIRAS contacted ISU's Department of Materials Science and Engineering to conduct a study on the effects of water and sludge on the Reliable tooling. ISU's Professor L.S. Chumbley conducted a study involving qualitative chemical analysis, scanning electron microscopy (SEM) and x-ray energy dispersive spectroscopy (EDS). The written report was intended to provide Reliable and its customers with an independent study on the state of the tooling and evidence of the long term usefulness of the tooling. Professor Chumbley provided Reliable with a comparative analysis of submerged tooling versus new tooling. The report concluded there was significant oxide film on the submerged tools;

however, it could be removed with small amounts of cleaning, and any visual residue was superficial. The cutting edge of the tools did not sustain any noticeable defects or pitting after being cleaned and examined under 500X magnification. The concluding sentence from Professor Chumbley's report, ".....the presence of the film should have little or no effect on tool performance in a wear application," provided Reliable and its customers with the assurances they were looking for. As a result of CIRAS's assistance, Reliable began selling the 'flooded' tooling that otherwise would have been scrapped.

Results:
* Retained sales of $400,000.

Testimonial:
"Professor Chumbley's detailed analysis gave us confidence that the flooded cutting tools could be used without worry of premature failure that could result in increased expenses due to scrapped parts."
Brian Macek, Vice President of Manufacturing